Experimental system for the mouse polyomavirus life cycle study

Abstract:

Murine polyomavirus (MPyV) is the prototype of the *Polyomaviridae* family. This family includes also some important human pathogens (BKV, JCV, Merkel cell polyomavirus). Due to their specific properties viruses within this family may serve as versatile vectors for gene therapy or recombinant vaccine production.

New methodological approaches may help to understand some yet unknown facts about MPyV life cycle. Clarification of some processes during murine polyomavirus life cycle may be also important to fully exploit polyomaviruses for therapeutic purposes.

The aim of this diploma thesis was to preparare two innovative experimental systems that extend possibilities of studying the life cycle of MPyV. The first part of the diploma thesis focusses on construction of recombinant MPyV which expresses yellow fluorescent protein (EYFP) in the early stages of infection. Such virus can be very useful for studying the infection spreading by live-cell imaging and Fluorescence-Activated Cell Sorting (FACS) and can be employed for co-localization studies of YFP-tagged LT antigen with certain cellular proteins.

Second part of the diploma thesis describes preparation of a hybrid cell line prepared by fusion of mouse and monkey cells. This new cell line facilitates quick and easy identification of the putative encapsidation signal in genome of MPyV. The hybrid cell line may also be used for preparation of vectors for gene therapy derived from murine polyomavirus.